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Quantum fluctuations in semiconductor quantum dots and their contributions to the self-energy functions of exciton states

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Abstract

Influence of quantum fluctuations in a system consisting of a quantum dot and the reservoir of acoustic phonons on processes in which the quantum dot takes part is investigated. Under some conditions this influence is shown to be very strong. We find a contribution from the quantum fluctuations to the self-energy function of the exciton coupled to the quantum dot.

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